



Safety advice.

Compressed gases

Safety Data Sheet/ARIGON®
H5
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1. PRODUCT AND COMPANY IDENTIFICATION Product

Name	VARIGON® H5
UN-Number	UN 1954
Recommended Use	Gas Metal Arc Welding
Synonyms	N/A

Manufacturer's Registered Office	Oxygen House, P-43 Taratala Road, Kolkata - 700 088, India www.linde.in
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Telephone Number	(+91 33) 66021600
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24 Hour Emergency Contact Number:	(+91) 9831851034
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2. HAZARDS IDENTIFICATION

WARNING!	EMERGENCY OVERVIEW Extremely flammable gas Simple asphyxiant Contents under pressure may explode if heated Keep at temperatures below 52°C / 125°F	Explosive mixtures with air
Appearance Colorless	Physical State Flammable compressed gas	Odor Odorless

Potential Health Effects

Principle Routes of Exposure Inhalation.

Acute Toxicity

Inhalation Asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to an oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness, and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

Eyes None known. Contact with rapidly expanding gas near the point of release may cause frostbite.

Skin None known. Contact with rapidly expanding gas near the point of release may cause frostbite.

Skin Absorption Hazard No known hazard in contact with skin.

Ingestion Not an expected route of exposure.

Chronic Effects None known.

Aggravated Medical Conditions None known.

Environmental Hazard See Section 12 for additional Ecological Information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Volume %	Chemical Formula
Argon	7440-37-1	95	Ar
Hydrogen	1333-74-0	5	H ₂

Additional information: Composition listed covers broad ranges rather than exact percentages for specific products.

4. FIRST AID MEASURES

Eye Contact None required for gas. If frostbite is suspected, flush eyes with cool water for 15 minutes and obtain immediate medical attention.

Skin Contact None required for gas. For dermal contact or suspected frostbite, remove contaminated clothing and flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physician should see the patient promptly if contact with the product has resulted in blistering of the dermal surface or in deep tissue freezing.

Inhalation PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF INHALATION OVEREXPOSURE. RESCUE

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PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

Conscious inhalation

victims should be assisted to an uncontaminated area and inhale fresh air. If breathing is difficult, Administer oxygen under medical supervision / trained personnel supervision. Unconscious persons should be moved to an uncontaminated area and, as necessary, given artificial resuscitation and supplemental oxygen. Treatment should be symptomatic and supportive.

Ingestion None under normal use. Get medical attention if symptoms occur.

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Flammable Properties Extremely flammable.

Suitable Extinguishing Media Dry chemical or CO₂. Water spray or fog.

Unsuitable Extinguishing Media DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.

Explosion Data

Sensitivity to Mechanical Impact None

Sensitivity to Static Discharge Yes

Specific Hazards Arising from the Chemical Hydrogen is very light and may collect in the upper portions of storage areas. Hydrogen burns with an almost invisible flame. High-pressure releases may ignite with no apparent ignition source possibly via static electricity. Continue to cool fire exposed cylinders until flames are extinguished. Cylinders may rupture under extreme heat. Damaged cylinders should be handled only by specialists.

If possible, stop the flow of gas. Do not extinguish the fire until the supply is shut off as otherwise, an explosive ignition may occur. If the fire is extinguished and the flow of gas continues, use increased ventilation to prevent the build-up of an explosive atmosphere. Ventilation fans must be explosion-proof. Use non-sparking tools to close container valves.

Isolate spill or leak area for at least 100 meters (330 feet) in all directions. Vapors from liquefied gas are initially heavier than air and spread along the ground. Vapors may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.). Vapors may travel to the source of ignition and flashback. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from the area and let the fire burn.

Use water spray to cool surrounding containers. Be cautious of a Boiling Liquid Evaporating Vapor Explosion, (BLEVE), if the flame is impinging on surrounding containers.

Protective Equipment and Precautions for Firefighters As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. All equipment used when handling the product must be grounded. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Monitor oxygen level.

Environmental Precautions Beware of vapors accumulating to form explosive concentrations. Prevent spreading of vapors through sewers, ventilation systems and confined areas.

Methods for Containment Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. If leaks in container or container valve, contact the appropriate emergency telephone number in Section 1 or call your closest Linde location.

Methods for Cleaning Up Return cylinder to Linde India Limited.

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7. HANDLING AND STORAGE

Handling

Ground and bond all lines and equipment associated with the product system. All equipment should be non-sparking and explosion-proof. Remove all sources of ignition. Use only in ventilated areas. Hydrogen is non-corrosive. However, hydrogen can interact with metals (hardened steels) to cause embrittlement.

Never attempt to lift a cylinder by its valve protection cap. Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a trolley designed to transport cylinders. Use equipment rated for cylinder pressure. Use backflow preventive device in piping.

Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing leak to occur. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.

Never put cylinders into trunks of cars or unventilated areas of passenger vehicles. Never attempt to re-fill a compressed gas cylinder without the owner's written consent. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.

For additional recommendations, consult rule number 20 of the Gas Cylinders, Rules, 2016.

Storage

Outside or detached storage is preferred. Protect from physical damage. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling. Store it in a cool, dry and well-ventilated area of non-combustible construction away from high traffic areas and emergency exits. Keep at temperatures below 52°C / 125°F. Full and empty cylinders should be segregated. Use a "First-In-First-Out" (FIFO) inventory system to prevent full cylinders from being stored for excessive periods of time. Always store and handle compressed gas cylinders in accordance with rule number 21 of the Gas Cylinders, Rules, 2016.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

This product does not contain any hazardous materials with occupational exposure limits established by the region-specific regulatory bodies.

Engineering Measures

Local exhaust ventilation to prevent accumulation of high concentrations and maintain air-oxygen levels at or above 19.5%.

Ventilation

Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/Face Protection

Wear protective eyewear (safety glasses).

Skin and Body Protection

Work gloves and safety shoes are recommended when handling cylinders. Cotton or Nomex® clothing is recommended to prevent static build-up.

Respiratory Protection

General Use

No respiratory equipment is needed if workplace oxygen levels are kept above 19.5%.

Emergency Use

Use positive pressure airline respirator with escape cylinder or self-contained breathing apparatus for oxygen-deficient atmospheres (<19.5%).

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practices.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless.	Odor	Odorless.
Odor Threshold	No information available.	Physical State	Compressed gas
Flash Point	No information available.	Autoignition Temperature	570°C / 1058°F (Hydrogen)
Flammability Limits in Air	(For Hydrogen)		
Upper	75%		
Lower	4%		

The following information is for the NON-INERT components of this mixture:

Chemical Name	Boiling Point	Melting Point	Molecular Weight	Evaporation Rate	Water Solubility	Vapor Pressure	Vapor Density (Air=1)	Gas Density Kg/m ³ @20°C
Hydrogen	-252.8°C	-259.2°C	1.00	-	0.019 (vol/vol @ 20°C and 1 atm)	Above critical temperature	0.07	0.08

The following information is for the INERT components that may be part of this mixture:

Chemical Name	Boiling Point	Melting Point	Molecular Weight	Evaporation Rate	Water Solubility	Vapor Pressure	Vapor Density (Air=1)	Gas Density Kg/m ³ @20°C
Argon	-185.9°C	-189.4°C	39.94	-	0.056 (vol/vol @ 0°C and 1 atm)	Above critical temperature	1.38	1.65

10. STABILITY AND REACTIVITY

Stability	Stable.
Incompatible Products	Oxidizing agents.
Conditions to Avoid	Heat, flames and sparks. Flammable or explosive when mixed with chlorine or other oxidizing materials. Fluorine and hydrogen react at -418°F (-250°C) when impurities are present. Chlorine/hydrogen mixtures explode if exposed to light. Lithium metal will burn in a hydrogen atmosphere.
Hazardous Decomposition Products	None known.
Hazardous Polymerization	Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product Information

LD50 Oral:	No information available.
LD50 Dermal:	No information available.
LC50 Inhalation:	No information available.
Inhalation	Product is a asphyxiant.
Repeated Dose Toxicity	No information available.

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Component Information

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Hydrogen	-	-	15000 ppm (Rat) 1 h

Chronic Toxicity

Chronic Toxicity	None known.
Carcinogenicity	Contains no ingredient listed as a carcinogen.
Irritation	No information available.
Sensitization	No information available.
Reproductive Toxicity	No information available.
Developmental Toxicity	Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and in experimental animals.
Synergistic Materials	None known.
Target Organ Effects	None known.

12. ECOLOGICAL INFORMATION

Ecotoxicity

The environmental impact of this product has not been fully investigated.

Ozone depletion potential; ODP; (R-11 = 1): Does not contain ozone depleting chemical.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods	Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to Linde for proper disposal.
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14. TRANSPORT INFORMATION

Proper Shipping Name	Compressed gas, flammable, n.o.s.
Hazard Class	2.1
Subsidiary Class	None
UN-No	UN1954
Description	UN1954, Compressed gas, flammable, n.o.s. (Hydrogen, Argon), 2.1

15. REGULATORY INFORMATION

Labeling of cylinders:	Label 2.1: flammable gas.
Risk phrases:	R12 Extremely flammable.
Safety phrases:	S9 Keep container in a well-ventilated place. S16 Keep away from sources of ignition – No smoking. S33 Take precautionary measures against static discharges.

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16. OTHER INFORMATION



General: Ensure all national / local regulations are observed. The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Document Information: In preparing this document help has been taken from MSDS for Linde (US)

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End of Safety Data Sheet

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